1.   A process for producing a maraging steel excellent in fatigue characteristics which comprises:

melting a steel having a composition consisting essentially of, in % by weight:

C: 0.01% or less,

Ni: 8-19%,

Co: 8-20%,

Mo: 2-9%,

Ti: 0.1-2%,

Al: 0.15% or less,

N: 0.003% or less,

O: 0.0015% or less,

and the balance Fe and the Ti component segregation ratio and the Mo component segregation ratio in its structure being 1.3 or less each;

casting the molten steel to obtain a steel ingot;

hot forging the steel ingot at a forging ratio of at least 4;

then submitting to soaking treatment by keeping the forged piece one or more times at a temperature range of 1100-1280°C for a total hot holding time of 10-100 hours;

and then plastic working the forged piece.

2.   A process for producing a maraging steel excellent in fatigue characteristics which comprises:

melting a steel having a composition consisting

essentially of, in % by weight:

C: 0.01% or less,

Ni: 8-19%,

Co: 8-20%,

Mo: 2-9%,

Ti: 0.1-2%,

Al: 0.15% or less,

N: 0.003% or less,

O: 0.0015% or less,

and the balance Fe and containing a nonmetallic inclusion in its structure having a size of 30 μm or less when the size of the nonmetallic inclusion is expressed by the diameter of a corresponding circle taking the circumferential length of the nonmetallic inclusion to be the circumference of the corresponding circle;

casting the molten steel to obtain a steel ingot of a taper $Tp = (D1 - D2) \times 100/H$ of 5.0-25.0%, a height-diameter ratio $Rh = H/D$ of 1.0-3.0, and a flatness ratio $B = W1/W2$ of 1.5 or less, taking the diameter of a corresponding circle with a circumference corresponding to the circumferential length of the top of the steel ingot as D1, the diameter of a corresponding circle with a circumference corresponding to the circumferential length of the bottom of the steel ingot as D2, the height of the steel ingot as H, the diameter of a corresponding circle with a circumference corresponding to the circumferential length of the steel ingot at a location of H/2 as D, and the length of the long side and length of the short side of the steel ingot at a location of H/2 as W1 and W2,

respectively;

and plastic working the steel ingot to make the size of a nonmetallic inclusion in the steel be 30 μm or less when the size of the nonmetallic inclusion is expressed by the diameter of a corresponding circle taking the circumferential length of the nonmetallic inclusion to be the circumference of the corresponding circle.

3.   A process for producing a maraging steel excellent in fatigue characteristics which comprises;

melting a steel having a composition consisting essentially of, in % by weight:

C: 0.01% or less,

Ni: 8-19%,

Co: 8-20%,

Mo: 2-9%,

Ti: 0.1-2%,

Al: 0.15% or less,

N: 0.003% or less,

O: 0.0015% or less,

and the balance Fe and containing a nonmetallic inclusion in its structure having a size of 30 μm or less when the size of the nonmetallic inclusion is expressed by the diameter of a corresponding circle taking the circumferential length of the nonmetallic inclusion to be the circumference of the corresponding circle;

casting the molten steel to obtain a steel ingot of a taper Tp = (D1 - D2) x 100/H of 5.0-25.0%, a height-diameter

39

ratio Rh = H/D of 1.0-3.0, and a flatness ratio B = W1/W2 of
1.5 or less, taking the diameter of a corresponding circle
with a circumference corresponding to the circumferential
length of the top of the steel ingot as D1, the diameter of a
corresponding circle with a circumference corresponding to the
circumferential length of the bottom of the steel ingot as D2,
the height of the steel ingot as H, the diameter of a
corresponding circle with a circumference corresponding to the
circumferential length of the steel ingot at a location of H/2
as D, and the length of the long side and length of the short
side of the steel ingot at a location of H/2 as W1 and W2,
respectively;

forging the steel ingot at a forging ratio of at
least 4 for a forged piece;

then submitting to soaking treatment by keeping the
forged piece one or more times in a temperature range of 1100-
1280°C for a total hot holding time of 10-100 hours;

and then plastic working the forged piece to make
the size of a nonmetallic inclusion in the steel be 30 μm or
less when the size of the nonmetallic inclusion is expressed
by the diameter of a corresponding circle taking the
circumferential length of the nonmetallic inclusion to be the
circumference of the corresponding circle.